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Analysis of Forty-four Cases treated by the Writer, together with the Result of Treatment.

BY

JOHN O. ROE, M. D.,

ROCHESTER, N. Y.

REPRINTED FROM

The New York Medical Journal

for September 3, 1887.

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ANALYSIS OF FORTY-FOUR CASES TREATED BY THE WRITER, TOGETHER WITH THE RESULT OF TREATMENT

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JOHN O. ROE, M. D.

ROCHESTER, N. Y.

VICE-PRESIDENT OF THE SECTION OF LARYNGOLOGY, NINTH INTERNATIONAL MEDICAL CONGRESS

REPRINTED FROM THE NEW YORK MEDICAL JOURNAL FOR SEPTEMBER 3, 1887

NEW YORK
D. APPLETON AND COMPANY
1887

HAY FEVER.

ANALYSIS OF FORTY-FOUR CASES TREATED BY THE WRITER, TOGETHER WITH THE RESULT OF TREATMENT.*

On considering the cloud of nebulous theory which has surrounded the subject under consideration, and the mass of speculation which has been propounded by the numerous writers on this subject during the past four years, it is with some hesitation that I have presumed to occupy any portion of your valuable time with a further discussion of this subject. It is my purpose, however, not to enter into a theoretical discussion of the subject, or to review the various opinions held by different writers, but to give a brief analysis of the cases which have come under my observation, and to present the conclusions deduced from such observation.

I have purposely retained the term "hay fever" to designate the affection under consideration, for the reason that it is a universally accepted term, and that all fully understand what is implied by it. In applying to the affection the more scientific terms that have been proposed, we have, in many instances, to explain the meaning of the terms before their significance is fully understood. In some instances the names proposed for the affection imply a mere hypothesis.

* Read before the American Laryngological Association at its ninth annual congress.

Since I first observed that this affection was related to nasal disease, I have treated forty-four cases, including the hay-fever season of last year. It is often true that an erroneous conclusion is drawn from the observation of a single case of a disease, because it may present phenomena of an unusual character. The number of cases which I have treated, although not large, is, however, sufficient, I think, to direct us to quite definite conclusions, as I have been particularly careful to observe and systematically record them.

The study of these cases has substantially confirmed the opinions which I expressed in my first article on this subject in February, 1883,* although in some respects my views have been more or less modified. While, as you already know, Dr. Daly † was the first to call attention to the clinical connection between hay fever and nasal diseases, the writer was the first to explain the relation of cause and effect between them, through the correlation of the vaso-motor or the sympathetic nervous system, and to point out the value of the galvano-cautery in the treatment of the nasal disease.‡

Of the 44 cases I now report to you, 27 were in males and 17 were in females, the ages of the males ranging from 21 to 51, and of the females from 19 to 58. Of the males between the ages of 20 and 30, there were 6; between 30 and 40, 13; between 40 and 50, 4; and between 50 and 60, 4.

* "The Pathology and Radical Cure of Hay Fever, or Hay Asthma," "N. Y. Med. Jour.," May 12, 19, 1883. See also a second article on the same subject, "N. Y. Med. Jour.," May, 3, 10, 1884.

† "The Relations of Hay Asthma and Chronic Naso-pharyngeal Catarrh," "Arch. of Laryngol.," iii, 1882, p. 157.

‡ Since that time both Dr. Daly's observations and my own have been fully confirmed by many careful observers and writers on this subject both in this country and in Europe, among whom are Hack, Herzog, Hering, Böcker, Bresgen, Massei, and McBride, of Europe, and Mackenzie, Bosworth, Allen, Sajous, Ingals, Robinson, and Seiler, of our own country.

Of the females between the ages of 15 and 20, there was 1; between 20 and 30, 7; between 30 and 40, 3; between 40 and 50, 5; and between 50 and 60, 1.

Of the 27 males, there were 5 farmers, 5 merchants, 2 railroad engineers, 2 real-estate dealers, 1 physician, 1 lawyer, 1 banker, 1 clergyman, 1 insurance agent, 1 contractor, 1 book-dealer, 1 hotel clerk, 1 superintendent of public instruction, 1 commissioner of pensions, 1 grocer, 1 carpenter, 1 traveling salesman. Of the 16 females, there were 1 vocalist, 1 music teacher, 1 school-girl, and 1 worker in a shop, and the remaining 12 had no occupation other than their domestic duties. Of these 44 patients, 7 had been suffering for 10 years, 7 for 8 years, 6 for 4 years, 4 for 2 years, 3 for 14 years, 2 for 6 years, 2 for 12 years, 2 for 15 years, 2 for 20 years, 2 for 30 years, and 1 each for 3, 7, 9, 11, 13, 16, and 17 years.

The date of the commencement of the attack varied from May 1st to August 21st. It is a significant fact that in every instance active symptoms of the affection subsided soon after the appearance of frost. The connection between the cause of the irritation and the frost will be alluded to further on.

In nearly every case there was a special proclivity to repeated and successive colds in the head, with more or less nasal obstruction. In several instances the attacks dated from a particular year in which the patient had taken, during the summer months, *an exceedingly severe cold in the head.* About one fourth of the forty-four patients—from the fact that they were subject to repeated colds in the head—considered their hay fever, for the first two or three years, simply an aggravated form of their accustomed colds.

In several instances, on interrogating the patients regarding the nasal passages and asking whether they suffered from so-called nasal catarrh during the remainder of

the year, they stated that they were entirely free from any such difficulty during the remainder of the year, except an occasional cold in the head. An examination of these cases revealed in every instance, however, disease of the nasal passages, and areas so sensitive that the slightest touch of the probe excited sneezing, and in some instances well-marked hay-fever symptoms.

In all but 5 of these 44 cases I found inferior turbinated hypertrophy. In these 5 cases there was an excessive vascularity of the parts and dilatation of the cavernous sinuses, which were collapsed when free from irritation so that the passages were entirely clear, but by the application of the slightest irritant they would at once become distended sufficiently to occlude the nostrils. In 19 cases, deviation of the septum was found with angular projection from the deflected side. In 11 cases there was deviation to the left side, and in 8 to the right. In 23 cases the middle turbinated bodies on one or both sides were found hypertrophied and projecting against the septum. The location of the special points of sensitiveness was by no means constant. They were usually found over the region of the greatest amount of hypertrophy. In very few instances were they confined alone to the posterior end of the turbinated bodies, or alone to the anterior inferior turbinated bodies. Not only in a majority of the cases were they not confined to the turbinated bodies, but in most of the cases the septum was quite as sensitive as any portion of the turbinated bodies. In some instances the septum was more sensitive, and sneezing and hay-fever symptoms were more readily developed than in any other portion of the nose.

The sensitive areas of the septum were in a majority of the cases over the lower and posterior part. In one third of the cases, however, small, rounded, pad-like masses of hypertrophied tissue were also found on the middle of

the upper portion, and so exquisitely sensitive that violent sneezing would be induced by the lightest touch of the probe. In some other cases, every portion of the septum was exquisitely sensitive.

In 33 of the 44 cases, dust was found to be an exciting cause, while in 26 of these 33 cases it was given as the principal cause. Rag-weed was an exciting cause in 15 cases, in 9 of which it was the principal cause. In many cases irritation was also produced by other substances, as the fumes of matches, coal-gas, new-mown hay, and the pollen of flowers, especially of roses. In some cases an attack could be caused by a large number of different substances.

So positively were many affected by the pollen of rag-weed that they could predict the date of their attack by the time of the ripening of the weed. If for any reason the season was backward, and the rag-weed retarded in ripening, their attack would be correspondingly delayed.

Of the 44 cases, 32 of the patients were attacked with asthma. In six it came on at the beginning of the hay fever, in thirteen after the affection had continued for about two weeks, while in the remainder it appeared only after the greater portion of the irritation in the nose had subsided.

The presence of the dust of dried hay at any time of the year would excite in some a temporary attack of hay-fever and asthma, and ten were thus subject to asthmatic attacks brought on by the inhalation of certain substances which the patients recognized as especially irritating to them, such as the fumes of a sulphur match or coal-gas.

In some cases, asthmatic attacks were associated with each fresh cold in the head, while in some others, asthmatic attacks were excited by the inhalation of these substances without the occurrence of a coryza. It is a noticeable fact in these cases that those most sensitive to the inhalation of foreign substances, and those in whom the asthmatic attacks

were excited with less apparent irritation in the nose, were those who had been long sufferers from this affection; while in those who had been sufferers but a short period, it was exceptional that asthmatic attacks were excited without a more decided irritation of the nasal passages. In every case where there was marked disease in the nasal cavity, there was also more or less hyperæmia of the larynx and pharynx, and in some cases this amounted to a chronic pharyngitis, laryngitis, and bronchitis. As a rule, the amount of pharyngeal, laryngeal, and bronchial inflammation depended upon the severity of the attacks, the amount of chronic disease existing in the nasal passages, and the length of time the patient had been subject to hay-fever.

Of these 44 patients, but 12 had what is termed a nervous temperament, while 9 were distinctly phlegmatic. The others were of intermediate types of temperament, the classification of which is somewhat arbitrary. Four of the patients who were distinctly nervous were entirely free from any nervous excitability before their first attack of hay fever; but this condition developed afterward in a corresponding degree to the severity of the subsequent attacks, and the systemic depression that followed them corresponded in nearly every instance to their severity or to the number of years the patients had been sufferers.

In order, therefore, for the production of this affection, we must have, first, a localized disease in the nasal passages, rendering the tissues unduly sensitive to local irritation, and, secondly, an external irritant brought by the atmosphere in contact with the sensitive tissue. Irritation reflected to the nose from other organs which may be diseased and susceptible to local irritation can not properly be classed with the affection under consideration, but should be considered with the diseases of the parts from which the irritation is reflected. It is on account of a lack of discrimination that

hay fever is so often confounded with all the other affections of a reflex character in which the nares and bronchi may be involved.

The sequence of events in the evolution of this affection, it is believed by the writer, is as follows: A continued irritation of the nerve-filaments in the nose causes the nerve-ganglia, or centers from which these nerves are derived, to become unduly active, and in due time abnormally so. This abnormal activity is in turn reflected to the other nerves radiating from this center, and these nerves in turn take on increased activity, which is made manifest in increased vascularity of the parts which they supply, owing to the diminished control of the afferent vessels. This activity of the nerve-centers increases in proportion to the degree or length of time that the primary irritation continues, and finds expression in a corresponding increased vascularity and irritability of the parts to which these nerve-filaments go. Now, inversely in proportion to the increased activity of the center is the degree of irritation required to excite it.

At the beginning of the attack of hay-fever a strong irritant is required to start the train of symptoms. After a time, as the nerves and the nerve-centers become more sensitive to impressions, a lesser irritant is required to start the same train of symptoms, and the influence of the irritation is also extended to other connecting nerve-centers and the parts supplied by them. After a time, also, the parts that were secondarily irritated become primary points of irritation, and act in conjunction with the primary seat. This train of symptoms can be traced in nearly every case. At first we see simply an inordinate vascularity of the parts directly irritated, next we have the same condition in all the parts to which this ganglion sends its nerve-filaments—as the conjunctive lacrymal apparatus and the larynx and pharynx—then in the next ganglion in the chain and

the parts to which it sends nerve-filaments, and so on till every nerve-center of this chain becomes involved in this undue activity, and the point is reached when the centers controlling the vascular supply of the trachea and bronchi are involved, culminating in a chronic bronchitis. This clearly explains why asthma is readily induced by the inhalation of substances that may have ceased to be irritating to the tissue in the nasal passages, when their susceptibility has been removed by appropriate treatment. Those writers who have been led to believe that there is no connection between nasal disease and this asthma overlook the influence which the disease in the nose has exerted in bringing about this condition.

It can not be denied that the ganglionic centers of persons having a susceptible nervous organization are more readily affected by such local irritation than those having a less susceptible organization, but I do not believe that such natural susceptibility is necessary in order that this train of symptoms may be started.

The neurotic habit, as it has been termed, is therefore imaginary, and not a necessary factor in the evolution of this affection; but, with the continuance of the affection, a neurosis, as above explained, is developed that is as much secondary to the primary disease in the nose as the nervous disturbance resulting from an abscess in the ear is secondary to a diseased tooth that may have been the direct cause of the abscess by the irritation of the otic ganglion. Hack recognizes this factor when he says: "It certainly can not be determined, *a priori*, how many of the symptoms may be attributed to a neurotic condition, for, in not a few cases, the neurasthenic symptoms may be secondary, produced by the depressing influence of hay-fever attacks." *

* "Ueber Catarrhus autumnalis und Heufieber," "Dtsch. med. Woch.," xii, 1886, p. 143.

Even in choreic affections Dr. Jacobi observes that "there is not necessarily a direct connection between these irregular choreic symptoms of local origin and general neurosis—at least, the former do not depend upon the latter." *

As this ganglionic involvement continues, the patients become susceptible to minor irritations from sources quite different from those which were at first required to excite an attack. This is shown by the fact that in every case the patient soon became susceptible to the inhalation of lesser irritants throughout the year, which before the onset of his hay fever would have had no effect whatever upon him.

An engorgement of the turbinated bodies that may be the result of an irritation reflected to the nose from a diseased tooth or a diseased ear, can with propriety be termed a "vaso-motor coryza," but is not to be classed with the affection termed hay fever. This affection is one distinctly excited by irritation applied to some portion of the lining membrane or tissue of the respiratory track, and taken there in the inspired air. That this is the invariable direction from which the irritation comes is shown by the fact that in every instance all the phenomena will cease immediately on the removal of the patient to a place where the air is entirely free from all foreign substances, no matter how hot the atmosphere or bright the sunlight. The local irritants that are carried in the atmosphere during the summer months are numerous, but it is unquestionable that the most virulent irritant to this diseased nasal tissue is the pollen or spores of plants, the pollen of some plants being more irritating to one individual than to another, and *vice versa*. Why this is so we do not know. It is according to an unexplained law, which, if we knew, would explain why some foods, medicines, etc., can be taken by some per-

* "Am. Jour. of the Med. Sci.," April, 1886, p. 518.

sons with the happiest results, while to others they are decidedly poisonous. It is a significant fact that, with the appearance of frost, the active symptoms of this affection cease. The only conclusive explanation of this is that the exciting cause is a vegetable substance which the frost affects by destroying its virulence and rendering it inert.

The conditions of temperature or sunlight are not direct excitants of attack; where they aggravate the attack it is by lowering the resistance of the person to the action of the irritant, in the same manner that, as we lessen the resistance to a galvanic current, the electrical action becomes correspondingly stronger.

No small amount of the relief obtained at sea-side or mountainous hay-fever resorts is due to the bracing effect of the atmosphere and changed mode of living, which simply increase the inhibitory force of the whole system, as well as to the comparative freedom from dust, pollen, and other irritating substances. The relief during the attack that is often afforded by drugs, or even, as in some cases, by a single dose of opium, is due more to the inhibitory effect of the drug in arresting the transmission of the irritation than in the benumbing of the local sensibility.

Mental emotions have a marked effect on the inhibitory action of the system, and especially on the part on which the mental effort is concentrated, and have the same effect on the vascular control of the part as irritation of the part—that is, to dilate the capillaries and increase the vascular supply. In this manner the connection between the mental association of a hay-field or roses and a coryza is accounted for.

The direction in which this irritation may be reflected or carried is in every instance, like the electric current, in the line of the least resistance. If one set of ganglia is weaker and has less inhibitory power, it is in that direction

that the irritation will be transmitted. Thus, in one instance the irritation may be expressed in a supra-orbital neuralgia, hemicrania, or megrim; in another, in facial spasm, choreic symptoms, or epileptiform seizures; while in others it may find expression in a coryza, a pharyngitis, a laryngitis, a bronchitis, or in sneezing, cough, laryngeal spasm, or asthma.

We come now to perhaps the most interesting and important part of the subject—the question of the nature of the treatment, and the success attending it, for, without the latter, our other studies are without value.

The only rational and successful treatment of this affection is to restore the parts involved to a normal condition. If we find a preponderance of local disease in the nose, we must of course restore the nose to a normal condition. If we find a limited amount of disease in the nose, but the resistance of the system so lowered from any other cause as to permit a ready transmission of the irritation to the nerve-centers, we must of course restore the system to a normal condition, and thus increase its resistance to local irritation. In some instances in which the irritation of the nose is slight and of short duration, the use of bromides and of the so-called nerve tonics, or a sojourn at a sea-side or mountain resort, will increase the inhibitory force sufficiently to give entire relief. In some cases of this kind where the affection is slight, the use of cocaine in benumbing the terminal filament of the nerve-fibers—thus cutting off the local irritation in the nose—is sufficient to arrest an attack. The effect of cocaine, however, in nearly all cases is merely temporary, for, as soon as the effect is gone, the symptoms return with renewed vigor from the fact that the secondary effect of cocaine is in nearly all cases that of a slight irritant.

In a number of cases in which I have resorted to the use of cocaine, when patients have consulted me during the at-

tack, the relief was almost instantaneous, but unfortunately the application of the drug must be frequently made, and in sufficient quantities to produce some constitutional effect, and, as this effect is depressing to the system in a marked degree, its use during the entire hay-fever period can not be continued.

In the majority of cases there is so much local disease in the nose that no amount of tonics can increase the inhibitory force of the system sufficiently to overcome the affection. The only way to effect a radical cure in these cases is to remove by local treatment the conditions in the nose, and in other portions of the respiratory tract that have become secondarily involved, which render the individual so highly susceptible to local irritation.

The plan which I have followed in the main has been to remove the redundant tissue in the nose by the cold-wire snare before employing other agencies; then to correct any deflections of the septum and to remove all bony outgrowths; next with a probe to seek out sensitive areas and cauterize them with chromic acid or destroy them with the galvano-cautery. The plan of "superficial alteration" of the nasal mucous membrane by the galvano-cautery, which is advocated by Dr. Sajous,* has not given me the satisfactory results he claims for it. It has been by means of deep cauterization that I have obtained the best results. I do not wish it to be understood that I recommend the wholesale destruction by the galvano-cautery of all the tissues of the nasal passages that may contain limited sensitive areas, whereby unnecessary cicatrices may be caused, and, as Dr. Cohen † very justly remarks, thus prepare the ground for less benign diseases in the future. The inordinate desire which is often shown to completely exter-

* "N. Y. Med. Jour.," Dec. 6, 1884, p. 629.

† "Am. Jour. of the Med. Sci.," xci, 1886, p. 310.

minate with the galvano-cautery every turbinated body possessed by persons subject to hay fever should be condemned, not only on account of the irreparable damage that is done, but because, as Dr. Beverley Robinson* remarks, structures are often removed which are in reality inoffensive.

There are two plans of deep cauterization which I adopt according to the requirements of the case. When there is connective-tissue hypertrophy, I make linear incisions with a fine cautery point well down to the bone. In this manner we cut off the sensitive nerve-filaments, and at the same time leave ample mucous membrane to spread over the surface destroyed, and, as the deep cicatricial tissue contracts, the remaining tissues are firmly drawn down over the turbinated bone, whereby both the sensitiveness and the vascularity are obliterated.

Another plan, and one which I adopt in cases where there is great distensibility of the cavernous sinuses without interstitial hypertrophy, is to attack the part when in a distended condition, employing a long and very fine platinum point, and thrusting it when heated deeply into the tissue. We can then sweep the point about to any desired extent and destroy the cavernous sinuses underneath by making but one small opening in the surface where the point is introduced. The septum is dealt with according to the plan of making linear incisions when hypertrophy exists, and the destruction of limited areas found to be sensitive. But for the *superficial alteration* of the mucous membrane, chromic acid is by far preferable to any other agent. Not only should every portion of the nasal cavity receive the requisite attention, but the condition of the pharynx, larynx, and bronchia must not be overlooked. It is not uncommon that enlarged tonsils will keep the turbinated bodies in a condi-

* "Med. News," xlix, 1886, p. 59.

tion of chronic hyperæmia. Dr. Jacobi very truly says: "Many a rhinitis has to be treated in the pharynx, and many a pharyngitis in the nose; and both may never get well unless the enlarged and abnormal tonsils have been removed or resected." *

It is often also that the neglect to cure a chronic bronchitis accounts for the reappearance of hay asthma after the susceptibility of the nasal passages to irritation has been entirely removed.

The result attending these cases is as follows: 36 of the 44 patients have been cured; 4 were not relieved owing to imperfect treatment, due to the neglect of the patient; and 4 I have lost sight of. Of the 36 who were cured, 20 have remained exempt from the first year of treatment to the present time—1 of them for 9 years, 1 for 7 years, 1 for 5 years, 2 for 4 years, 6 for 3 years, 5 for 2 years, and 4 for 1 year. The remaining 16 of the 34 had some slight irritation about the nose and eyes on hot, dusty days during the first season following treatment. This was found to be due to some remaining disease in the nose, the treatment of which has rendered them exempt since that time.

From a study of these cases I am led to the following conclusions:

1. That all cases of hay fever have their initiatory lesion in a diseased condition of the tissues of the nasal fossæ.

2. That the disease of these tissues induces, in the ganglionic centers connected with them, an abnormal activity, which is reflected to other tissues and organs.

3. That the sensitive areas in the nose are not confined to any particular locality, and that there are no zones in the nose that when irritated invariably produce the same manifestations.

* *Op. cit.*, p. 522.

4. That the direction in which the irritation is reflected is, like an electric current, always along the line of least resistance, and that from the same region it may be reflected in one direction at one time, and in the opposite direction at another time.

5. That the disease in the nose may produce disease in other portions of the respiratory tract, which may become independent centers of irritation.

6. That the affection distinctly recognized as hay fever is due to the effect of a local irritant, brought by the atmosphere in contact with the sensitive regions of the air-passages.

7. That the affection is not *per se* a neurotic disease, nor necessarily associated with a nervous temperament, although persons having a highly nervous temperament or a neurosis are much more susceptible to the influence of a local irritant.

8. That the neurotic condition which is often regarded as a cause of hay fever is itself often developed as the result of the local irritation.

9. That by carefully correcting all abnormal conditions found in the nasal or other portions of the respiratory passages, and the use of such systemic medication as may be required to remove any associated or consequent general derangement, we need not fail to cure hay fever.

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